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ABSTRACT

The term "multimedia" is defined as the integration of text, audio sound, static graphic images, animations, and full motion video. Multimedia encompasses a number of components and levels of sophistication, and has come to denote the cutting edge of a technology that continues to change with unprecedented speed. Gaining a proficiency in authoring multimedia resources may involve a steep learning curve and significant cost to implement the infrastructure needed to support the work. This paper discusses the elements of a multimedia presentation; the structure and procedure for authoring multimedia resources; the types of computer applications that may be used; the opportunity costs associated with the allocation of staff time and equipment for different levels of multimedia resources; and provides examples of successes and failures encountered with the use of multimedia presentations in library instruction and expert systems at the University of Nebraska at Omaha. Authoring multimedia resources can make one's job easier and can provide expanded service to the academic community. (SWC)

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Authoring Multimedia in an Academic Library

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The buzz-word Multimedia has come to denote the cutting edge of a technology that continues to change with unprecedented speed. There are, however, a number of components and levels of sophistication that may be included in that catch-all word. This presentation seeks to cut through some of the hype by discussing the elements that are combined within a multimedia presentation, the types of computer applications that may be used, and to provide some insight on the use of this technology based on the successes and failures encountered during the past year at UNO in the areas of library instruction and expert systems. Through this presentation, one can see how authoring these types of resources can make one's job easier and potentially provide expanded service to the academic community.

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Authoring Multimedia in an Academic Library

Multimedia resources permit the addition of a human touch to the high-tech; by adding a voice or video clip, illustrating a sequence of steps with animation, or providing access to truly interactive expert systems. There may be little doubt that such enhancements to these computerized resources provide a broader range of information in a more palatable environment. Gaining a proficiency in authoring these resources, however, may involve a steep learning curve, and the economic cost of the infrastructure needed to support this work, though continually falling, remains significant. The question, therefore, remains: "How will using this technology make my job easier, the service provided to the academic community better, or the resource more appealing to those who use it?"

Academic libraries have used computer based multimedia resources for help stations and library instruction for nearly ten years.[1] The literature usually discusses pilot projects or new initiatives. The focus of this paper, however, turns to a more mundane use of these resources, and seeks to provide a threefold answer to the practical questions raised earlier by first discussing the structure and procedure for authoring multimedia resources. Second, the opportunity costs associated with authoring different levels of multimedia resources will be discussed in terms of allocation of staff time and equipment cost. Finally, presentations used in or developed at the Library at the University of Nebraska

at Omaha will be used as examples of practical applications for multimedia resources within an academic library.

The term multimedia has been used in a number of contexts. "Essentially, *multimedia* is the integration of text, audio sound, static graphic images, animations, and full-motion video. Multimedia may use some or all of these aspects of communication."[2] The advantage of providing electronic assistance to one's patrons can be seen in three ways. It provides a medium in which users have access to the librarian's expertise at the user's convenience. Secondly, it provides virtual support for the growing number of electronic resources provided through the library. Finally, students in elementary and secondary education are gaining a facility with electronic resources that indicates an ability to use interactive systems, if not an expectation that virtual assistance would be provided at the university level.

Information becomes more important when a practical need is evident. The so-called "Teachable Moment" refers to the optimal time for providing content.[3] Interactive multimedia applications permit library users to access the help they need, when they need it. Thus, assistance in locating and using appropriate resources, formatting citations, or identifying possible avenues of research becomes most useful when the user needs that information to complete a project. Towards this end, Archimedes was developed as a HyperCard Reference Tool for use in the Engineering Library at the University of Michigan. This tool provided an explanation of library services, locations within the

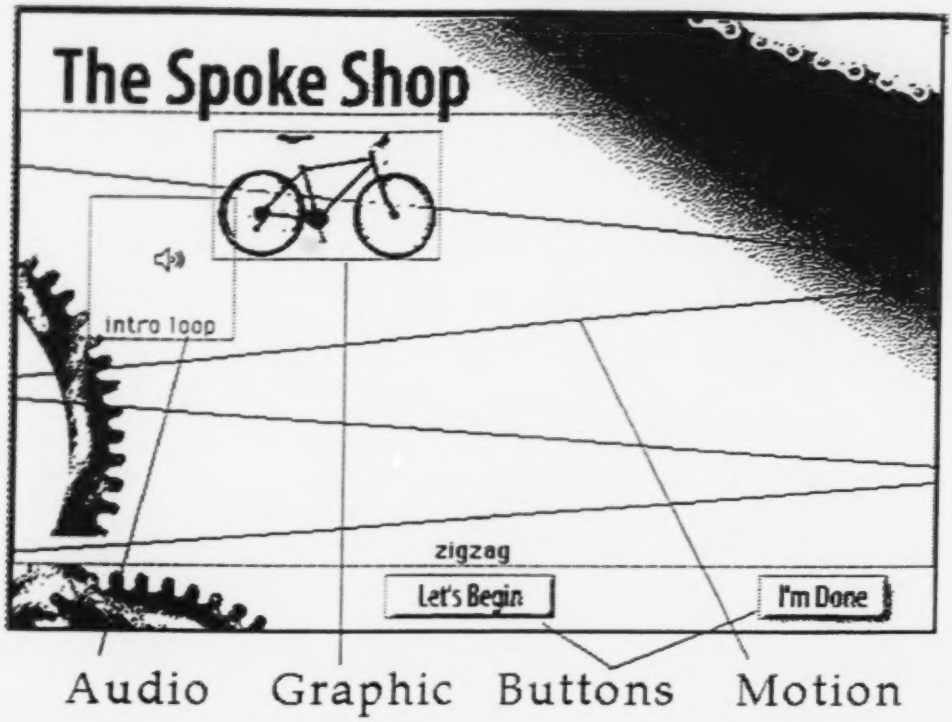
library and maps as well as some basic reference assistance. After analyzing the use it received, Michigan librarians concluded that this resource "shows promise as a cost-effective way to provide reference service - especially at sites and times where reference questions taper off in both difficulty and frequency."[4]

The nature of a library's holdings are also changing as electronic resources assume greater prominence within the collection and become more accessible to remote users through modem or internet connections. Interactive multimedia tutorials or context sensitive help can provide assistance in choosing which source is most appropriate and which method is the most effective way to use a particular resource. Useful online assistance can also prepare users for more effective use of their time when they come to the library through familiarizing them with the available services, collections and building floor plans.

Students In Nebraska primary and secondary schools increasingly are involved in using and developing multimedia resources. A presentation at the Omaha New Media Expo provided an insight into the sophisticated use of technology these students have acquired.[5] The five projects discussed ranged from creating internet resources and a CD ROM of HyperCard stacks to working on a simulated space shuttle mission. Each of these projects placed the students in a high-tech environment in which they used computers to author or interact with multimedia resources.

Creating a multimedia presentation consists of putting individual images, sounds or videos into a presentation software. This can be as straightforward as ordering a sequence of images

captured from a computer display, or as complex as overlaying two digitized video clips and adding a voice-over. In either case, the component parts are digitized, and then assembled in a particular presentation package. One gains facility with each of the programs used to the extent needed to complete the project. The modular nature of multimedia resources is illustrated below.[6]



The example consists of a graphic of a bicycle that follows the lines drawn on the screen. The audio loop contains a short digitized sound file, and the two buttons link this screen to two other screens of information. The background on which each of these components is assembled contains the title of the card and some bicycle graphics: the sprockets in the lower left hand corner and the chain across the upper right hand corner. Each of these

elements permits a sound to be played, a picture to be animated, or a link to be made. Each is separately placed on a background, and the presentation program, Oracle Media Works™, combines them when one runs the resource.

The opportunity costs involved in authoring this type of resource vary with the sophistication of the project. Nevertheless, there remain four areas to consider; infrastructure, development, staff training, and instruction. The scope and design of the project will determine the level of support required in each of these areas. The design and content of the presentation will lead one to the software needed to accommodate the data, the level of familiarity with the software needed by the author, and the hardware needed to facilitate the creation and use the resource.

Infrastructure includes all hardware and software needed to produce and use a multimedia resource as well as whatever networks facilitate the transmission of data between computers. A black and white HyperCard resource is relatively inexpensive to support, and basic concepts of creating a 'stack' are quickly mastered. Equipment needed to produce and run many of the early HyperCard efforts discussed in the literature can now be acquired for less than $300 per reconditioned Mac SE, and utilities such as HyperStudio provide a development tool that further assists the creation of these multimedia resources. The equipment needed to digitize video or scan color images substantially adds to the cost of both the authoring computer and the computer on which the resource is used. In addition, it requires the author to gain a greater familiarity with a wider range of software.

Developing the project involves defining the scope of the project, the type of examples used, the options and links between individual screens of information, and the extent to which the end user will interact with the program. Moving sequentially through a number of still images in a presentation merely requires one to linearly arrange a series of pictures. Creating interactive links or branches requires one to arrange the hierarchical associations and create appropriate links between the screens of information.

The nature of the multimedia project will determine the level of expertise individual staff members need to acquire, and the range of programs with which they need to be familiar. Capturing screen displays and placing the image in a sequential presentation requires the use of a capture program and basic knowledge of a presentation application such as HyperCard or Powerpoint. Digitizing video or editing scanned color images requires a more extensive knowledge of constituent programs and a more advanced knowledge of an appropriate presentation program.

If the multimedia resource is designed for an end-user other than the author, appropriate instructions or integrated help need to accompany the resource. Thus the scope and purpose of the project drives the infrastructure as well as the training needed to produce it.

Not every project is suitable for a multimedia package. Several factors need to be weighed when considering what will be used as a multimedia resource, and the primary question concerns choosing the appropriate technology within which to author the

resource. Generally speaking, the least sophisticated technology that will adequately support a project will be the best choice. It will usually require a more modest infrastructure and a shorter span of time to learn the software. Who will be using it determines the degree of documentation required, and considering where, when and how it will be used will determine the focus, content and appropriate infrastructure.

In designing resources for Bibliographic Instruction (BI) I use at UNO, I use the teaching workstation [a Powermac] to present a series of still images. The digital format of many of the resources I refer to in my presentation made it easier to digitally capture the screen displays, edit the captured image, and transfer it digitally in a HyperCard stack than to have the additional steps of making printouts and transparencies from the screen display. Furthermore, the potential exists for providing access to these presentations across the university via the campus Ethernet, and these stacks can provide the heart of interactive tutorials at a later date as well. Thus, preparing my BI presentations have been made easier, and the completed resources more valuable for later revision or expansion by using multimedia authoring software.

In the example below, a floor plan is placed above juxtaposed portions from two GENISYS screens to illustrate the various location designations within the library, and how they are displayed in GENISYS records. Portions of two screen displays were captured using Snapshot™, a screen capture program. Each image was placed on a card in HyperCard, and the floor plan was then drawn using a graphic tool within the HyperCard application.

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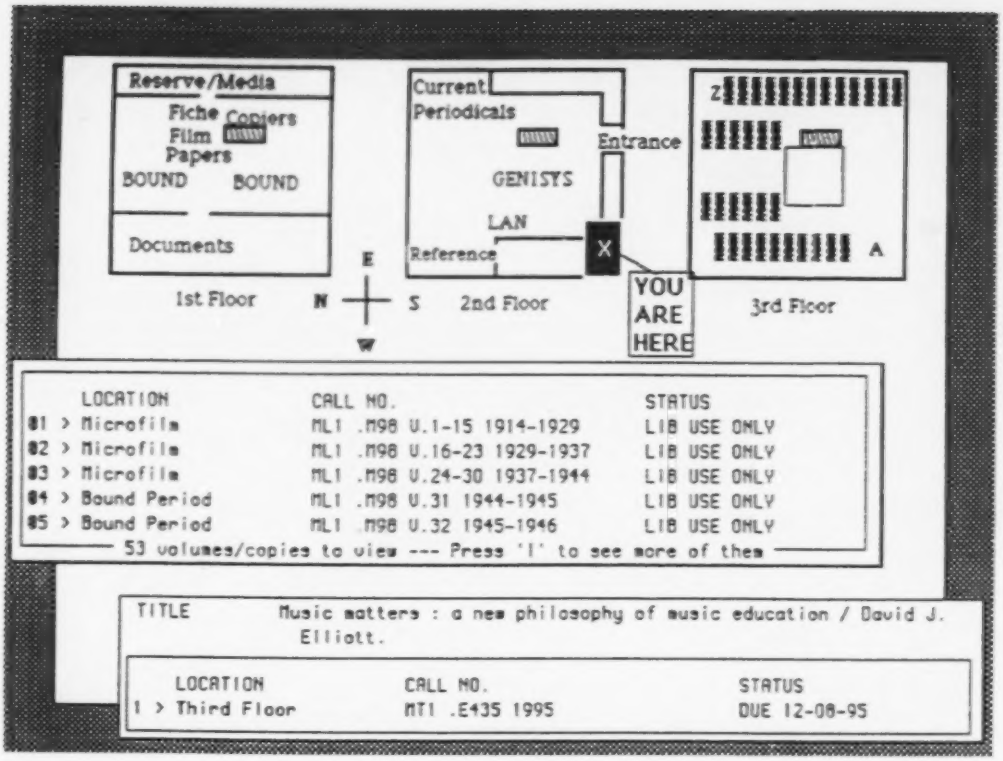
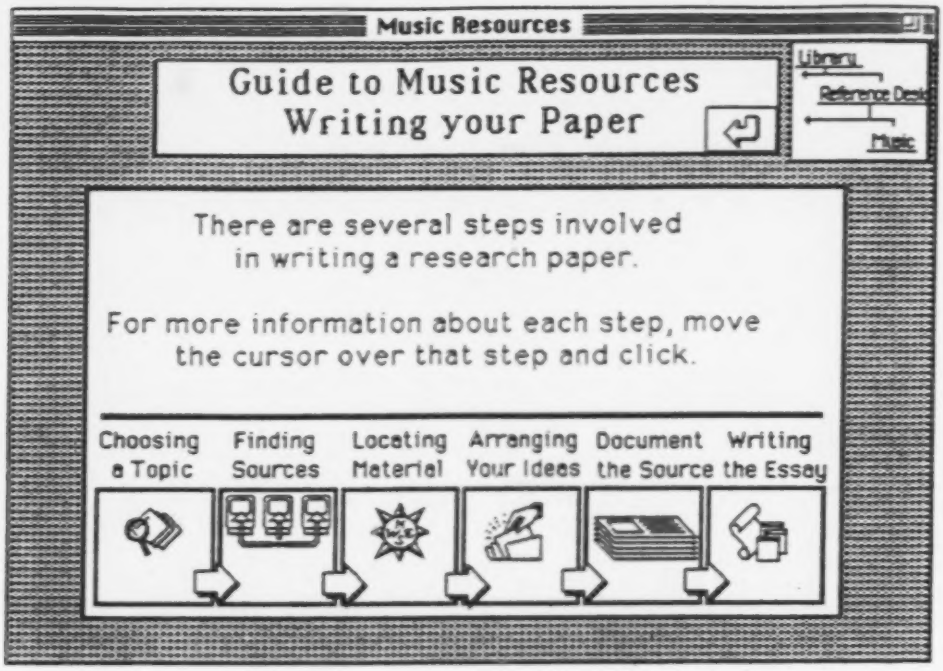


This BI presentation focuses on several key concepts that make one a more effective user of a library. This stack for BI in speech took perhaps 8 hours to design, digitize and complete. Authoring succeeding stacks for presentations in related areas were usually completed in a matter of 20 to 30 minutes, and it took less than five minutes to revise floor plans in each stack following the relocation of several areas on the second floor of the library during the Summer of 1996.

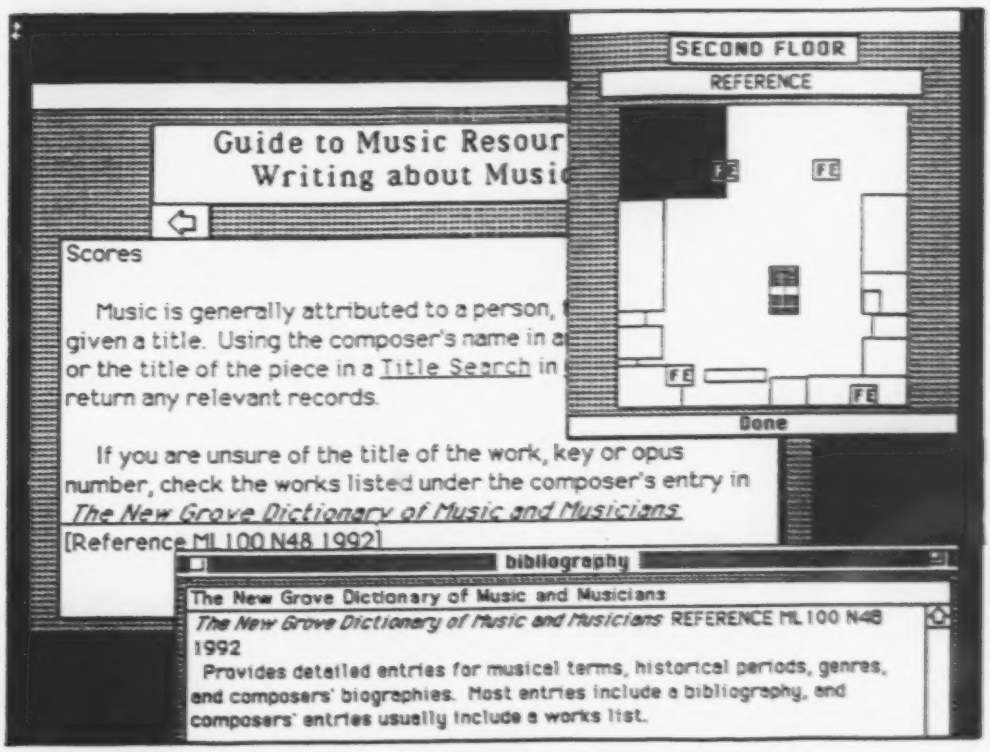
Computers provide the tireless tutor, and interactive modules can be created to introduce or review a topic. The example below outlines the steps involved in writing a research paper on a single screen. As the user moved the cursor within the boarder of any stage, a brief description of that point appears in



the box above. Each of the several stages is linked to a broader discussion of that topic on a different screen. Clicking on that stage takes the user to expand that discussion. A patron would be using it, so brief directions for the use of this resource are written in a prominent spot on the card. The interactive nature of the resource requires a computerized environment. The absence of color or scanned graphics made construction and support of this resource rather simple, taking about 4 hours. The interactive environment is facilitated through the use of scripts, written instructions that are executed when the cursor enters an area or clicks on a spot.

In designing a resource to handle ready reference questions one would be providing an interactive environment to be used by the patron. The use of searchable text fields and contextual

linking would permit the user the maximum degree of freedom in moving through the information contained within the resource. The example below is taken from a section of a prototype expert system in which the user can find the answers to many commonly asked questions. Clicking on any underlined word in the text brings the user to a definition for a word, an annotation for a listed source, or a location of a call number. The example above illustrates links between a description of the writing process, an annotated bibliography describing the source and a locating guide indicating where that source can be found.


SECOND FLOOR
REFERENCE
FE
FE
FE
FE
Done
Guide to Music Resour
Writing about Musi
Scores
Music is generally attributed to a person,
given a title. Using the composer's name in a
or the title of the piece in a Title Search in
return any relevant records.
If you are unsure of the title of the work, key or opus number, check the works listed under the composer's entry in The New Grove Dictionary of Music and Musicians.
[Reference ML 100 N48 1992]
bibliography
The New Grove Dictionary of Music and Musicians
The New Grove Dictionary of Music and Musicians REFERENCE ML 100 N48 1992
Provides detailed entries for musical terms, historical periods, genres, and composers' biographies. Most entries include a bibliography, and composers' entries usually include a works list.

These examples illustrate how authoring even modest multimedia presentations have made my work easier through

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eliminating redundant steps, making revisions easier, and permitting the time and resources used in one presentation to be easily integrated into succeeding projects. Interactive resources provide a resource by which users are able to progress at their own pace, and easily amplify the information within a certain discussion by going to more detailed information with the click of a mouse.

When beginning a project, it is important to remember that the learning curve will most likely exceed the technical horizon. Consequently a program used in authoring may be upgraded, or a peripheral superseded while the resource is being constructed. Furthermore, each enhancement requires substantially more resources to produce it as well as support the use of the resource.

Several points should be clear from this brief discussion of authoring multimedia resources. First, multimedia resources refer to resources created on a broad range of software, using a broad range of expertise, to produce a diverse array of products. Conceiving of the scope and content of the resource will determine appropriate software, levels of familiarity with these applications, and the complexity of the resource. Finally, using such resources makes one's job easier and provides the potential for enhanced service to those who use the library.

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[1]J.S. Ottaviani, "Archimedes: Analysis of a Hypercard Reference Tool," *College and Research Libraries* 56/2 (1995): 171-182.
[2]Paul Perry, *Multimedia: Developer's Guide*, (Indianapolis: Sams Publishing, 1994): 4.

[3]Noreen M. McAloon, "The Teachable Moment," *Journal of Reading* 36/2 (1992): 150-151.

[4]Ottaviani, p. 181.

[5]Neal Grandgenett et al, "Technology and Teaching: Trends for Tomorrow: Examples of Innovation in Technology Based Learning Environments." Presentation at the Omaha New Media Expo; Omaha, Nebraska, January 30, 1996.

[6] This card is taken from a demonstration package provided by Oracle Media Works™.